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SEA MONSTERS AND THE *'PREHISTORIC SURVIVOR PARADIGM'*

Par Dr. Darren NAISH

Tout au long l'Histoire des gens ont rapporté des observations de grands animaux marins qui ne semblent pas appartenir à des animaux connus de la Science. Les découvertes récentes de nouveaux grands animaux marins nous amène à penser qu'il existe encore de grands animaux à découvrir dans les mers.

Why believe in sea monsters?

Throughout history, people have reported sightings of large marine animals that do not seem to match any species recognised by science. The recent discovery of new, large marine animals (e.g., megamouth sharks, Indonesian coelacanths, *Bathyraja hesperafricana*, several new cetaceans), combined with data from discovery rates plotted over time (PAXTON 1998, RAYNAL 2001, SOLOW & SMITH 2005, WOODLEY et al. 2008), shows that the future discovery of large marine animals is not at all far fetched or unlikely. Furthermore, statistical analyses of eyewitness data indicate that most sightings occur at close range, rendering misidentification of known species unlikely (PAXTON 2009). Accordingly, at least some 'sea monster' accounts may well describe real, undiscovered species.

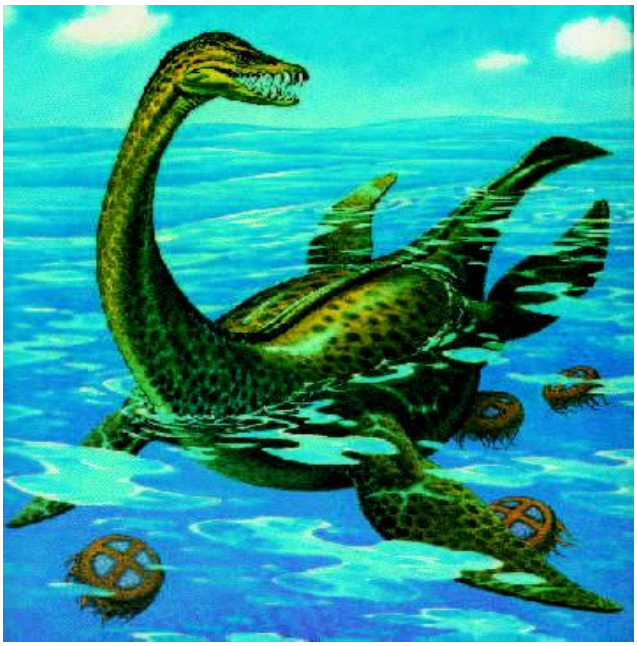
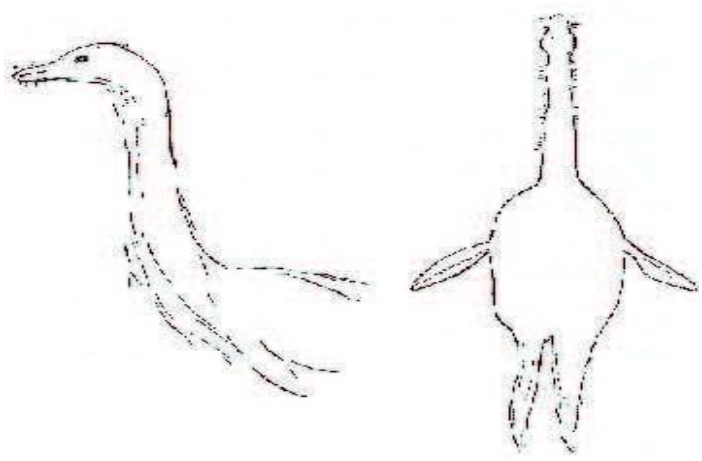


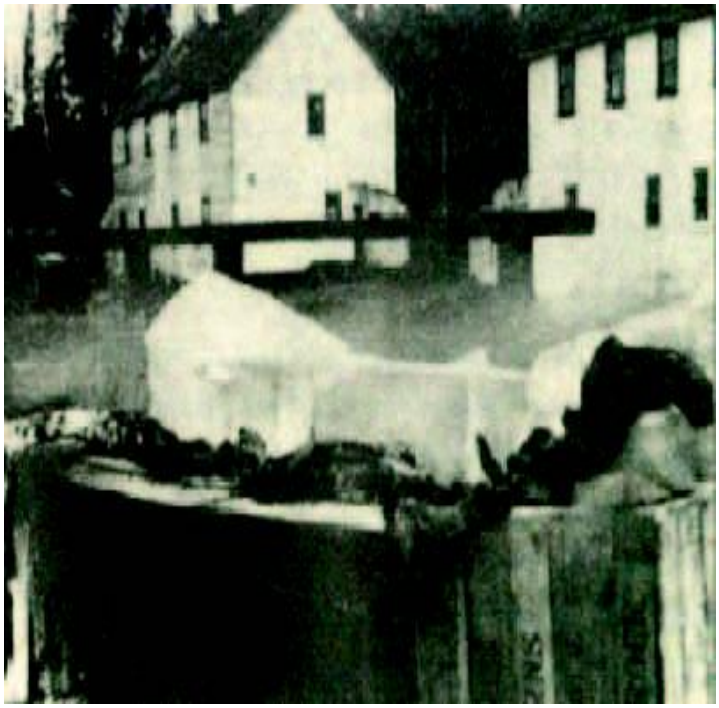
Fig. 1. Traditional reconstructions of plesiosaurs (such as this one) incorrectly show the animals with erect necks held up above the water surface.



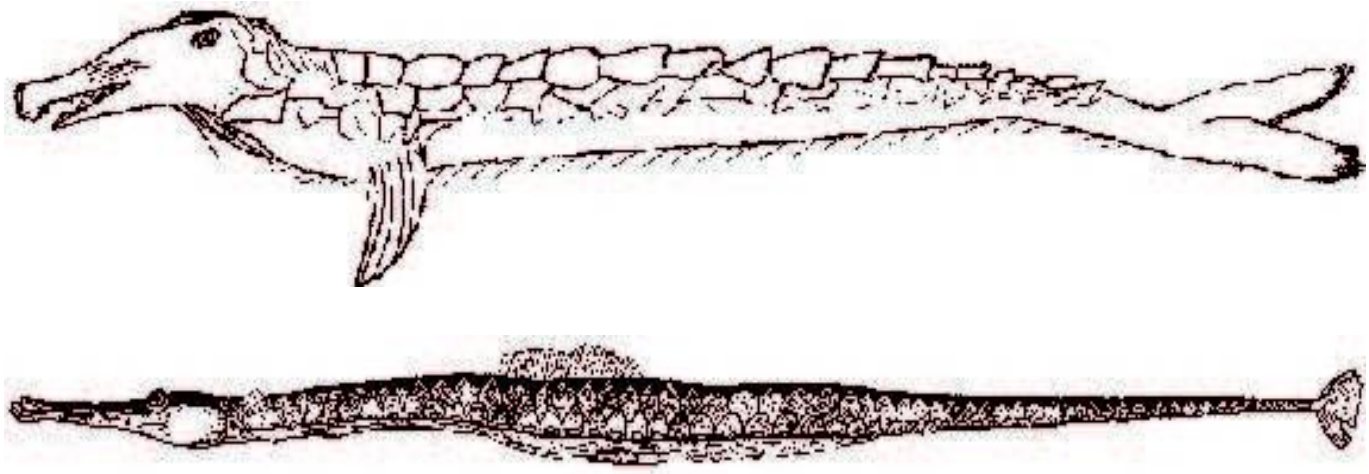
The Prehistoric Survivor paradigm

An idea that's persisted throughout more than 100 years of cryptozoological literature is that 'sea monsters' might be 'prehistoric survivors': that is, they might be the modern-day descendants of creatures otherwise known only from

the fossil record (specifically, plesiosaurs, mosasaurs and basilosaurid whales). This hypothesis has become known as the prehistoric survivor paradigm, or PSP. While the PSP has been endorsed throughout the writings of HEUVELMANS, Mackal and Shuker, it is not supported by all cryptozoologists.



For groups such as plesiosaurs, the fossil record shows that they died out at the end of the Cretaceous, and there are no post-Cretaceous fossils. Furthermore, long-necked sea monsters are described as being only superficially similar to plesiosaurs, and lack the unusual features of these animals. PSP advocates have suggested that post-Cretaceous plesiosaurs might have evolved a list of new anatomical and behavioural features (such as fur, whiskers, inflatable humps etc.) that make them look like modern sea monsters, and less like fossil plesiosaurs (SHUKER 1995). While this possibility cannot be discounted, it is nothing more than unfounded speculation, and – perhaps most importantly – it is simply not the most likely explanation of the data: in this case, that unusual pinnipeds might account for the sightings.

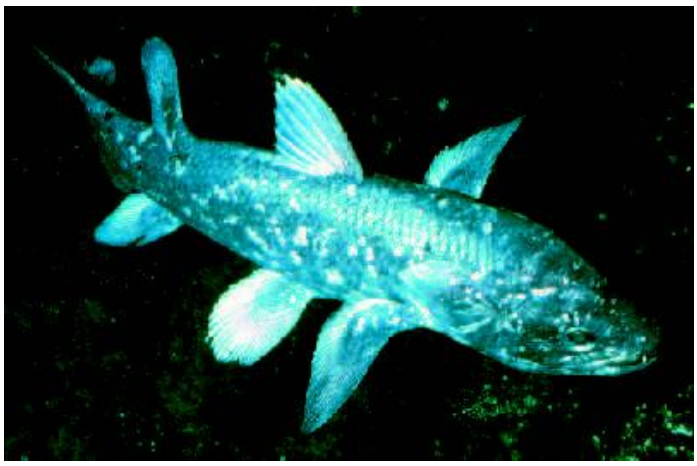


Cadborosaurus = a living plesiosaur?

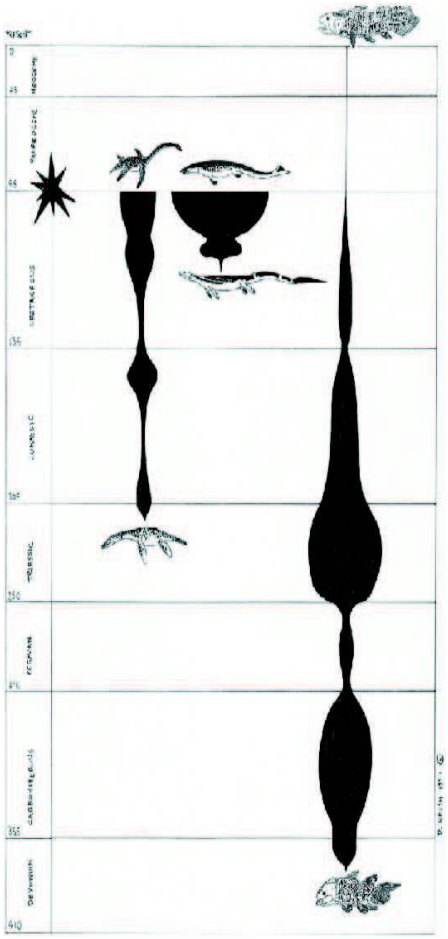
The most extreme version of the 'evolved plesiosaur' argument was put forward by BOUSFIELD & LEBLOND (1995). After proposing that the Naden Harbour carcass (Fig. 3) represented a new extant vertebrate species (dubbed *Cadborosaurus willsi*), they interpreted it as a reptile, and specifically as a plesiosaur. Plesiosaurs had broad, rounded bodies, enormous flattened pectoral and pelvic girdles, an interlocked, stiff basket of gastralia (= '*belly ribs'*), two pairs of wing-like flippers, and a short tail. *C. willsi* (assuming that it is a real animal!) is slender and serpentine, does not rely on its limbs for propulsion, has a paired, fluke-like tail structure, is furry, and sometimes has horns and/or whiskers. The hypothesis that *C. willsi* might be a plesiosaur can be rejected (BAUER & RUSSELL 1996, NAISH 2001, WOODLEY et al. 2008).

BOUSFIELD and LEBLOND (1995) used data from an alleged juvenile specimen to endorse their interpretation of *C. willsi* as a reptile, but the account in question (Captain William HAGELUND's account of 1968) most likely describes a pipefish (WOODLEY et al., submitted: Fig. 4).

Coelacanths are red herrings



The fossil record shows that we can be confident about the extinction of plesiosaurs, basilosaurids and other such groups. However, the fossil record is often incomplete and there are sometimes gaps where members of a lineage are absent for some period of geological time. So-called Lazarus taxa belong to groups that seem to have gone extinct, but then re-appear unexpectedly at a later date, or in the modern day. Coelacanths are one of the best known Lazarus taxa. Supposedly, they disappear from the fossil record for more than 60 million years. As a consequence, it is typical to see advocates of the PSP claim that coelacanths provide support for the possible survival to the present of plesiosaurs, basilosaurids and so on. This view can be rejected for three reasons.



1) The coelacanth fossil record is very different from that of plesiosaurs and other putative 'prehistoric survivors': coelacanths dwindled in diversity during the Cretaceous, and in fact for a while were thought to have become extinct long before the end of the Cretaceous. (2) Coelacanth bones are small, fragile, frequently non-diagnostic, and have low preservation potential. In contrast, the bones of plesiosaurs, basilosaurids and so on are dense, erosion-resistant and diagnostic. (3) The supposed 65-million-year gap in the coelacanth record does not exist in any case: in addition to the two living species, a Paleocene coelacanth is known from Sweden, and a Miocene coelacanth was reported in 1997 (Fig. 6).

In fact, so far as we know, there aren't any marine vertebrate groups that persisted for tens of millions of years without leaving a fossil record: the fossil record for big marine vertebrates is comparatively good (e.g., BARDET 1992, 1994, BENTON & STORRS 1994).

Conclusions

The idea that big marine vertebrate animals await discovery in the present day is not far-fetched or unlikely, and we should expect continuing discoveries (though whether such discoveries will be anything to do with the 'sea monsters' of tradition remains to be seen).

The *'prehistoric survivor paradigm'* relies on special pleading and speculation and can be rejected: plesiosaurs, mosasaurs and basilosaurids are extinct.

Coelacanths are red herrings, at least in so far as they can be used as analogues for putative 'prehistoric survivors'.

What data we have on 'sea monsters' is not good enough for firm conclusions to be reached about the creatures concerned: we don't know what they are and need more evidence!

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